

# TABLE OF CONTENTS

## CONTENTS

<b>ABBREVIATIONS AND DEFINITIONS .....</b>	A-1
<b>CHAPTER I – GENERAL DESIGN REQUIREMENTS .....</b>	I-1
<b>110 REQUIREMENTS FOR PUBLIC IMPROVEMENTS.....</b>	I-1
110.1 General .....	I-1
110.1.1 .....	I-3
110.1.2 .....	I-4
110.1.3 .....	I-4
110.1.4 .....	I-5
110.2 Precedence of Documents .....	I-5
110.3 Design Life of Improvements .....	I-5
110.4 Violations .....	I-6
110.5 Appeals.....	I-6
<b>115 SUBMITTAL REQUIREMENTS .....</b>	I-6
115.1 General .....	I-6
115.2 Design Plan Format.....	I-7
115.2.1 Plan View .....	I-9
115.2.2 Profile View .....	I-12
115.3 Site Grading Plan .....	I-13
115.4 Drainage Calculations .....	I-15
115.5 Other Requirements.....	I-15
115.6 Detail Sheets.....	I-16
115.7 Review Procedure .....	I-16
115.8 As-Built Drawings.....	I-17
<b>120 STREET DESIGN.....</b>	I-19
120.1 Functional Classification.....	I-19
120.2 Access .....	I-19
120.3 Width.....	I-19
120.4 Number of Lanes.....	I-19
120.5 Design Speed.....	I-19
<b>125 EASEMENTS .....</b>	I-20
<b>130 ACCURACY OF CITY MAPS AND PLANS NOT GUARANTEED.....</b>	I-21
<b>135 SURVEYING.....</b>	I-21
135.1 General .....	I-21
135.2 Existing Survey Monuments .....	I-21
135.3 New Survey Monuments .....	I-22

## CONTENTS

135.4	Global Positioning System (GPS) Specifications .....	I-22
135.5	Coordinate System and Control for Plats, Base Mapping, Monumentation, and As-Built Drawings .....	I-23
140	STRUCTURES .....	I-25
140.1	General .....	I-25
140.2	Design Criteria .....	I-25
140.3	Retaining Walls .....	I-25
140.4	Testing of PCC Concrete for Structures .....	I-26
145	DESIGN MODIFICATIONS.....	I-26
145.1	Modification Process for Specific Projects .....	I-26
145.1.1	Requested Modification .....	I-26
145.1.2	Review of Requested Modification .....	I-26
145.1.3	Appeal of Requested Modification.....	I-27
145.1.4	City-Initiated Modifications .....	I-27
145.1.5	Modification Criteria.....	I-27
145.2	Metric Standards .....	I-28
150	CONSTRUCTION .....	I-28
150.1	Work Hours .....	I-28
150.2	Inspections.....	I-29
150.2.1	City Inspector's Activities.....	I-29
150.2.2	Inspecting Engineer's Activities .....	I-30
150.3	Substitution of Products; "Approved Equal" Designation .....	I-32
150.4	Safety Requirements .....	I-32
150.5	Scheduling.....	I-33
150.6	Preservation, Restoration, and Cleanup .....	I-33
150.7	Interferences and Obstructions.....	I-36
150.8	Railroad Crossings .....	I-37
155	ENVIRONMENTAL PROTECTION DURING CONSTRUCTION .....	I-37
155.1	General Policy and Requirements .....	I-37
155.2	Air Pollution Control.....	I-38
155.3	Erosion Control .....	I-39
155.4	Maintaining Surface Water Quality .....	I-40
155.5	Fish and Wildlife Habitat Preservation .....	I-40
155.6	Control of Construction Noise Levels.....	I-40
155.7	Natural Vegetation .....	I-42

## CONTENTS

155.8	Historical and Archaeological Areas.....	I-42
155.9	Use of Pesticides .....	I-43
160	REVISIONS .....	I-43

## **CHAPTER II – STREETS**

210	STREET DESIGN.....	II-1
210.1	Subgrade Elevation .....	II-1
210.2	Structural Section .....	II-1
210.2.1	Aggregate Base .....	II-1
210.2.2	Asphalt Concrete Pavement Design and Construction.....	II-2
210.2.3	Asphalt Overlay Design and Construction .....	II-4
210.2.4	Portland Cement Concrete Pavement Design .....	II-4
210.3	Horizontal Alignment.....	II-6
210.4	Vertical Alignment.....	II-7
210.5	Intersection Sight Distance Policy .....	II-9
210.5.1	Visibility at Intersections .....	II-10
210.6	Intersections .....	II-11
210.7	Cul-de-sacs, Eyebrows, Turnarounds.....	II-13
210.8	Driveways .....	II-14
210.9	Curbs, Shoulders, and Grading .....	II-15
210.10	Sidewalks .....	II-16
210.11	Raised Medians .....	II-17
210.12	Subsurface Drainage .....	II-18
210.13	Major Roadway Structures.....	II-18
210.14	Transitions.....	II-18
210.15	Super Elevation Cross-Sections .....	II-19
210.16	Stub Streets.....	II-19
210.17	Private Streets, Parking Lots, and Common Driveways .....	II-19
210.18	Utilities and Other Work in a Public Right-of-Way.....	II-21
210.19	Trenching and Street Cuts .....	II-52

## **CHAPTER III – STORM DRAINAGE**

310	GENERAL .....	III-1
315	STORMWATER DESIGN ELEMENTS .....	III-4

## CONTENTS

315.1	Maintenance Vehicle (City's Vactor Truck) Access Requirements for Publicly Maintained Storm Water Quality/Quantity Facilities and Structures.....	III-4
315.2	Geometry and Other Requirements for Publicly Maintained Open Stormwater Quality/Quantity Facilities (Pond) .....	III-4
320	TELEVISION SCANS.....	III-5
330	STORMWATER QUANTITY STANDARDS .....	III-6
340	STORMWATER QUALITY STANDARDS .....	III-6
350	DRAINAGE REPORTS .....	III-7
360	PUBLICLY MAINTAINED PONDS, SWALES, AND OTHER VEGETATED AREAS .....	III-7
360.1	Topsoil.....	III-7

## **CHAPTER IV – TRAFFIC DEVICES AND STREET ILLUMINATION**

410	TRAFFIC SIGNS .....	IV-1
410.1	Materials.....	IV-1
420	STREET NAME SIGNS .....	IV-2
420.1	Street Name Sign Details .....	IV-3
430	TRAFFIC SIGNALS.....	IV-3
430.1	Design and Installation Requirements.....	IV-3
430.2	Design Drawing Requirements .....	IV-3
430.3	City Requirements.....	IV-4
430.4	Field Wire Testing.....	IV-4
440	TRAFFIC STRIPING AND MARKING.....	IV-4
440.1	General .....	IV-4
440.2	Materials.....	IV-5
440.3	Application .....	IV-5
440.4	Pavement Surface .....	IV-6
450	STREET ILLUMINATION.....	IV-6
450.1	General Design.....	IV-6
450.2	Option "A" Lighting.....	IV-7
450.3	Option "B" Lighting.....	IV-8
450.4	Option "C" Lighting.....	IV-8
450.4.1	Conduit.....	IV-8
450.4.2	Cable and Wire.....	IV-9
450.4.3	Poles .....	IV-10
450.4.4	Lighting Fixtures .....	IV-10
450.4.5	Controls .....	IV-11

## CONTENTS

450.4.6 Junction Boxes .....	IV-12
 <b>CHAPTER V – SANITARY SEWER SYSTEM</b>	
510 GENERAL .....	V-1
 <b>CHAPTER VI – WATER SYSTEM</b>	
610 WATER SYSTEM DESIGN .....	VI-1
611 MATERIALS .....	VI-5
611.1 Water Pipes .....	VI-5
611.2 Pipe Fittings .....	VI-5
612 PIPELINE INSTALLATION .....	VI-6
613 HYDROSTATIC TEST OF NEWLY INSTALLED WATERLINE .....	VI-8
614 STERILIZATION OF NEWLY INSTALLED WATERLINE .....	VI-9
615 TAPPING .....	VI-12
616 SAMPLING STATION .....	VI-12
617 CROSS CONNECTION CONTROL AND BACKFLOW ASSEMBLIES .....	VI-12
617.1 General .....	VI-12
617.2 Types of Backflow Prevention Assemblies.....	VI-13
617.3 Location of Backflow Prevention Assemblies and Vaults/Boxes .....	VI-15
617.4 Installation and Testing of Backflow Prevention Assemblies.....	VI-15
618 REQUIREMENTS FOR WATER SYSTEM VAULT INSTALLATIONS.....	VI-16
618.1 General .....	VI-16
618.2 Backflow Prevention Device Assembly Vaults .....	VI-17
618.3 Fire Services and Domestic Services .....	VI-17
618.4 Water Meter Vaults .....	VI-17
618.5 Pressure Reducing Valve Vaults .....	VI-18
619 SPECIAL REQUIREMENTS FOR FIRE SERVICE ONLY .....	VI-18
 <b>CHAPTER VII – BICYCLE AND PEDESTRIAN FACILITIES</b>	
710 GENERAL .....	VII-1
720 SHARED-USE PATHS .....	VII-1
720.1 Width and Clearance .....	VII-1
720.2 Horizontal Curves .....	VII-1
720.3 Pavement Structure .....	VII-2
720.4 Grade .....	VII-2
720.5 Sight Distance .....	VII-2

## CONTENTS

720.6	Landscaping .....	VII-2
720.7	Intersections .....	VII-2
720.8	Signing and Marking.....	VII-3
720.9	Structures.....	VII-3
720.10	Lighting .....	VII-3
720.11	Vehicle Traffic Restrictions .....	VII-4
720.12	Property Dedication.....	VII-4
730	ON-STREET FACILITIES.....	VII-5
730.1	Bicycle Lanes .....	VII-5
730.2	Shared Roadway.....	VII-5
740	BICYCLE PARKING STANDARDS .....	VII-5
740.1	Number and Location of Bicycle Parking Spaces.....	VII-6
740.2	Bicycle Parking Design .....	VII-6
740.3	Covered Bicycle Parking Spaces.....	VII-6
740.4	Bicycle Parking Facility Design.....	VII-8
740.5	Bicycle Parking Lighting .....	VII-8
		VII-8

## **CHAPTER VIII – STANDARD DRAWINGS**

810	GENERAL .....	
810.1	Application of Standard Drawings .....	VIII-1
810.2	Disclaimer and Design Engineer's Responsibilities.....	VIII-1
810.3	Requirements for Modification of a Standard Drawing .....	VIII-1
	INDEX OF DRAWINGS .....	VIII-1
	<b>Index to the Engineering Design Manual.....</b>	